LA-UR-21-28362
Approved for public release; distribution is unlimited.

Title: Nuclear Enterprise Science & Technology (NEST)

Author(s): Schreiber, Stephen Bruce

Intended for: Presentation

Issued: 2021-08-20

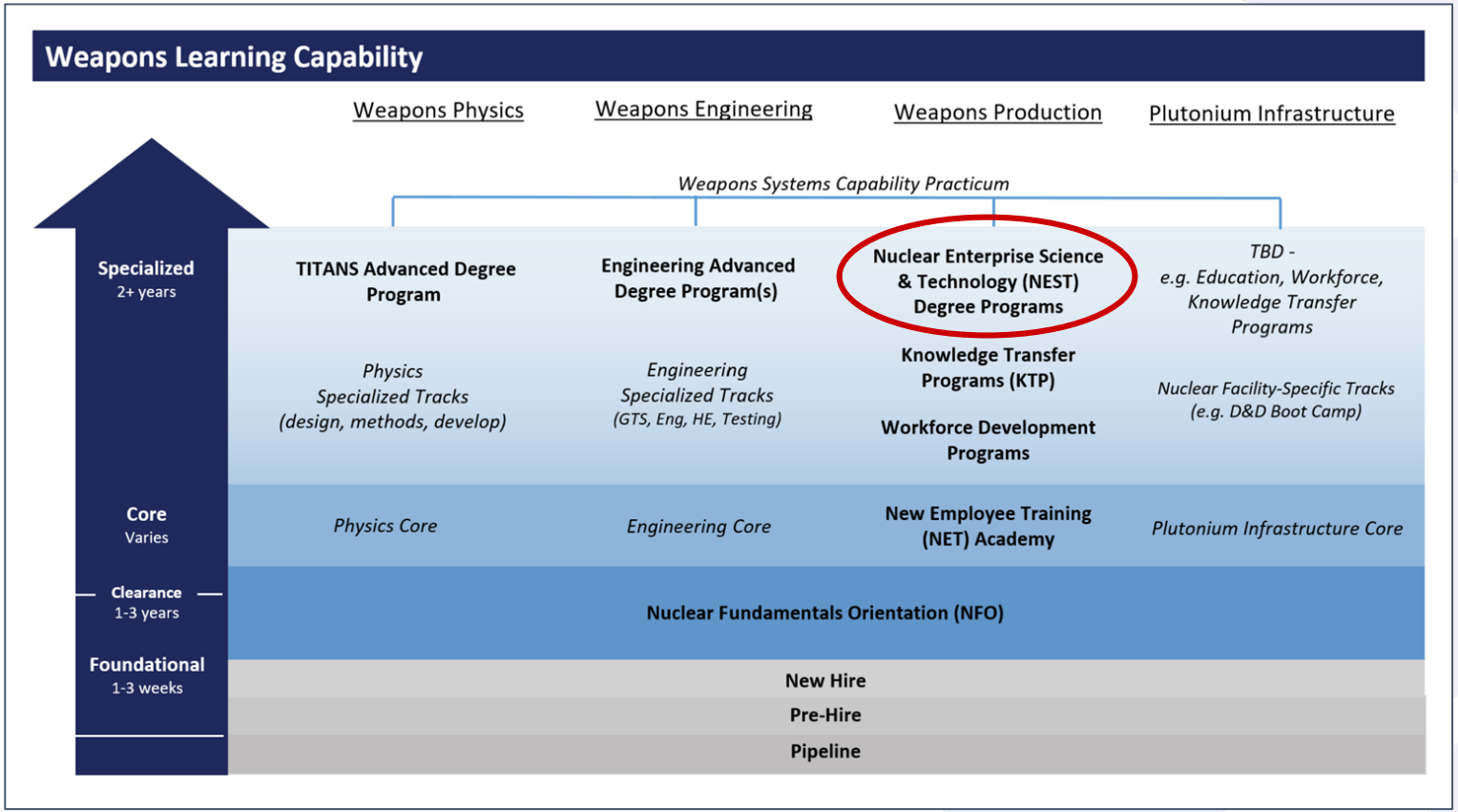
Los Alamos
NATIONAL LABORATORY

Nuclear Enterprise Science & Technology (NEST)

Stephen Schreiber
Actinide Operations

August 26, 2021

Learning Capability - NEST



Why provide a facility and operations-specific qualification and education program?

- **Modernize our approach to education** as an essential step to attracting and retaining **our future workforce**
- Establishing a meaningful workforce education program is a **key element of a cultural change** by providing more professional development options for personal growth and thus increased opportunities and career flexibility
- Designed a **nuclear enterprise workforce education program** to provide essential science, operations, and business education on all aspects of working in nuclear and radiological facilities
- NEST Certificate is **encompasses all DOE required training** and eventually is envisioned to be transferable
- Higher education leads to more engaged, invested and retained workers resulting **higher productivity, improved safety, and thus better mission performance**
- Eventually the program can be used as a regional **recruiting tool** for STEM candidates - student position, paid tuition, job placement

What is the NEST Certificate Program?

- The NEST Certificate Program is designed to provide students with the skills and experience to qualify for entry-level positions in nuclear facilities as **Fissile Material Handler** and/or **Glovebox Operator**

- Designed to be completed in a minimum of 1 year (2 semesters) of university level courses (30 credit hours)

- Certificate will be offered and awarded through the University of New Mexico – Los Alamos (UNM-LA)

UNM LOS ALAMOS

The program goal is to provide for a technically qualified workforce who can execute a variety of programmatic work in modern nuclear materials handling and processing facilities.

What is unique about the NEST Program?

- NEST is an immersive **education program**
- The **NNSA-required training** for nuclear material handlers and fissionable material handlers has been **cross-walked with the educational Core Curricula**
- Academic content will be delivered that **provides background scientific and engineering understanding of the fundamental concepts** behind this training
- Offered as a **Pilot Program to an incumbent cohort** to ensure that the Certificate meets programmatic needs
- NEST is modelled after a Wharton County Junior College (Texas) program to attract and produce nuclear reactor operators

NEST Certificate Program

Instruction and Administration

UNM-LA & LANL Joint Faculty, LANL SME's
UNM-LA Administrators

Location

UNM-LA classrooms, laboratory
LANL PF-4 laboratory OJT

Schedule (Spring 2021 Semester)

Designed to be completed in 1 year in 2 semesters (30 credit hours)
Pilot cohort of 15 LANL employees, Spring 2021 semester
Covid requirements mandated distance learning/hybrid learning

Attendance & participation in all classes

A regular semester = 16 weeks

Education as opposed to training which requires homework and reading assignments, quizzes, and formal examinations

Certificate Degree

Certificate Degree Requirements

Nuclear Facility Work (15 credits)

NFFW 1110: Nuclear Facility Fundamentals (5 credits)

NFFW 1120: Fissionable Material Handler (5 credits)

NFFW 1120L: Nuclear Facility Lab (5 credits)

Actinide Science Fundamentals (15 credits)

ASFD 1110: Introduction to Actinide Science (5 credits)

ASFD 1120: Nuclear Materials Process Techniques (5 credits)

ASFD 1120L: Nuclear Materials Processing Lab (5 credits)

NEST Certificate Program - Established	
Fall Semester	**Spring Semester**
NFFW 1110	ASFD 1110
NFFW 1120	ASFD 1120
NFFW 1120L	ASFD 1120L

Course Topics

Nuclear Facility Work (NFFW)

- Fundamentals of Radiation
- Nuclear Material Control & Accountability
- Criticality and Criticality Safety
- Fundamentals of Chemistry
- Chemical and Radiological Waste
- Materials-at-Risk
- Beryllium and Medical Surveillance
- Transient Combustible Program
- Radiation Protection Physics

Lab includes facility equipment and techniques

Actinide Science Fundamentals (ASFD)

- Analytical Science of Actinides
- Nuclear Materials Process Techniques
- Actinide Chemical Separation
- Ion Exchange
- Metallurgy of Plutonium
- Introduction to Pyrochemical Operations
- Oxidation and Corrosion
- Electronic Structure and Bonding
- Actinide Compounds and Applications

Lab includes process unit operations

Longer term benefits of the Certificate Program

- Provide employees with opportunities and options for future career growth
- The NEST Certificate focuses on education of LANL staff for working in our nuclear and radiological facilities
- Completion of the program delivers an academic Certificate along with DOE required training
- Students who wish to continue their education beyond the Certificate will have the ability to ladder their credentials with additional coursework for completion of an Associates of Applied Science degree

Cohort 1

“I am deeply motivated to always learn new things as that helps me gain new skills and knowledge that I can apply in the workplace.”

“I would like to strengthen my basic knowledge to assist my current team and the Pit Manufacturing program.”

Nuclear Enterprise

SCIENCE & TECHNOLOGY